



DEPARTMENT OF HOME SCIENCE

M.Sc. NUTRITION AND DIETETICS

Curriculum Framework, Syllabus, and Regulations

(Based on TANSCHHE Syllabus under Choice Based Credit System–CBCS)

(For the candidates to be admitted from the Academic Year 2023-2024)

TABLE OF CONTENTS

S.No.	Contents
1.	About the Programme
2.	Programme Educational Objectives
3.	Programme Outcomes
4.	Programme Specific Outcomes
5.	Eligibility
6.	General Guidelines for PG Programme
7.	Evaluation Pattern 8.1. Internal Assessment 8.2. Methods of Assessment 8.3. Written Examination Question Pattern 8.4. Methods of Assessment
8.	Project 8.1. Project Report 8.2. Project Evaluation
9.	Conversion of Marks to Grade Points and Letter Grade (Performance in a Course / Paper)
10.	Attendance
11.	Maternity Leave
12.	Any Other Information
13.	Faculty Course File Structure
14.	Common Template for PG Programme as per TANSCH
15.	Templates for Semesters
16.	Syllabus

**Mother Teresa Women's University,
Kodaikanal
Department of Home Science
M.Sc. Nutrition and Dietetics**

1. About the Department

The Primary Purpose of the Home Science Department is to provide opportunities for students to pursue a quality education in Home Science. Importance is placed on providing opportunities within the curricula for development of enhanced skills in critical thinking, communication, leadership and computer literacy. The Department of Home Science also seeks to provide students opportunities for growth beyond the classroom through a wide range of extracurricular activities, programmes and services through the maintenance of environment, cultural and intellectual diversity. The Courses offered under the Department of Home Science prevails in all three Research and Extension centres such as Madurai, Chennai and Coimbatore seeking opportunities for developing Academic Excellence, the students have more scope to get the exposure for research, projects, internship, industrial visit, and placement.

2. Programme Educational Objectives (PEOs)

- PEO1:** Graduates will demonstrate proficiency in the principles and practices of nutrition and dietetics, preparing them for entry-level positions in clinical, community, or food service settings.
- PEO2:** To apply their knowledge of nutrition and dietetics to promote health and wellness in individuals and communities, addressing diverse nutritional needs and cultural considerations.
- PEO3:** To engage in continuous professional development, pursuing further education, certifications, or advanced degrees to stay updated with the latest research, trends, and technologies in the field
- PEO4:** To advocate for policies and programs that promote public health and nutrition, addressing issues such as food security, malnutrition, and obesity in local, national, and global contexts
- PEO5:** Graduates will integrate scientific evidence into their decision-making process, critically evaluating research studies and applying evidence-based practices in the assessment, diagnosis, and treatment of nutrition-related issues.

3. Programme Outcomes (PO)

On completion of M.Sc. Nutrition and Dietetics Programme, students will be able to
PO1- To demonstrate a comprehensive understanding of the principles of nutrition sciences, including macro and micronutrient metabolism, food sources, and their impact on human health

PO2- Be proficient in conducting nutritional assessments, including dietary analysis, anthropometric measurements, and biochemical evaluations, to determine nutritional status and develop appropriate interventions..

PO3- To possess effective counseling and communication skills, enabling them to assess clients' nutritional needs, develop personalized dietary plans, and educate individuals and groups about healthy eating habits.

PO4- Be competent in food service management, including menu planning, food safety, procurement, and budgeting, to provide nutritionally balanced meals in various institutional settings.

PO5- To understand the principles of community nutrition and public health, including designing and implementing nutrition programs, advocating for food security, and addressing public health issues related to nutrition

PO6- To have the knowledge and skills to assess, diagnose, and manage nutrition-related diseases and conditions in clinical settings, collaborating with healthcare teams to provide optimal patient care

PO7- Be able to critically evaluate nutrition research, apply research findings to practice, and conduct basic research projects related to nutrition and dietetics.

4. Programme Specific Outcomes(PSOs)

On completion of M.Sc. Nutrition and Dietetics Programme, students will be able to

PSO1 – Be able to conduct comprehensive nutritional assessments, including dietary analysis, clinical assessments, and anthropometric measurements, to evaluate the nutritional status of individuals and communities.

PSO2 – Be proficient in planning nutritionally balanced menus for various populations, including those with specific dietary needs, and demonstrate skills in food service management, ensuring the quality and safety of food production and delivery

PSO3 – Be able to develop and implement therapeutic nutrition interventions for individuals with specific health conditions, integrating knowledge of medical nutrition therapy and dietary modifications

PSO4 – To have the ability to design, implement, and evaluate community-based nutrition programs, focusing on health promotion, disease prevention, and addressing nutritional needs in diverse populations.

PSO5 – Be capable of conducting research in the field of nutrition and dietetics, including interpreting research findings, applying evidence-based practices in their work, and contributing to the advancement of nutritional science.

5. Eligibility

A pass in B.Sc. Nutrition and Dietetics/Foods and Nutrition/ B.Sc.-Home Science/ B.Sc. Food Science and Nutrition/ B.Sc. Food Technology/B.Sc. Clinical Nutrition and Dietetics, B.Sc. Nutrition, Food Service Management and Dietetics, B.Sc.-Nutrition Food Service Management with computer applications or any B.Sc./ B.Voc. Degree related to Nutrition and Dietetics disciplines are eligible to register for the Degree of Master of Science.

6. General Guidelines for PG Programme

- i. **Duration:** The Programme shall extend through a period of 4 consecutive semesters and the duration of a semester shall normally be 90 days or 450 hours. Examinations shall be conducted at the end of each semester for the respective subjects.
- ii. **Medium of Instruction:** English

7. Evaluation (25+75): Evaluation of the candidates shall be through Internal Assessment and External Examination for Theory and Practical.

7.1. Evaluation Pattern

EVALUATION PATTERN		Maximum Marks (Theory & Practical)	Minimum Marks (Theory & Practical)
Internal Evaluation	Continuous Internal Assessment Test	25 Marks	13 Marks
	Assignments / Snap Test / Quiz		
	Seminars		
	Attendance and Class Participation		
External Evaluation	End Semester Examination	75 Marks	38 Marks
Total		100 Marks	50 Marks

***Minimum credits required to pass: 91**

7.2. Internal Assessment-CIA

There shall be three tests conducted by the faculty concerned and the average of the best two can be taken as the Continuous Internal Assessment (CIA) for a maximum of 25 marks. The duration of each test shall be one / one and a half hour.

7.3. End Semester Examination (Theory): Max.Marks:75 Time: 3 hrs.

7.4. Written Examination Question Paper Pattern

Theory Paper (Bloom's Taxonomy based)

(Common for PG Programmes)

Intended Learning Skills	Maximum 75 Marks Passing Minimum: 50% Duration: Three Hours
Memory Recall/Example/ Counter Example / Knowledge about the Concepts/Understanding	Part–A (10x2=20Marks)
	Answer ALL questions Each Question carries 2 marks Two questions from each Unit Question 1 to Question 10
Descriptions/Application (problems)	Part–B (5x5=25Marks) Answer
	ALL questions Each question carries 5 Marks Either - or Type Both parts of each question from the same Unit Question 11 (a) or 11(b) to Question 15(a) or 15(b)
Analysis/Synthesis / Evaluation	Part-C (3x 10 = 30 Marks)
	Answer any THREE questions Each question carries 10 Marks There shall be FIVE questions covering all the five units Question 16 to Question 20

Each question should carry the course outcome and cognitive level For instance,

[CO1 : K2] Question xxxx

[CO3 : K1] Question xxxx

7.5. Methods of Assessment

METHODS OF ASSESSMENT	
Remembering (K1)	<ul style="list-style-type: none"> The lowest level of questions requires students to recall information from the course content Knowledge questions usually require students to identify information in the text book.
Understanding (K2)	<ul style="list-style-type: none"> Understanding of facts and ideas by comprehending organizing, comparing, translating, interpolating and interpreting in their own words. The questions go beyond simple recall and require students to combine data together
Application (K3)	<ul style="list-style-type: none"> Students have to solve problems by using / applying a concept learned in the classroom. Students must use their knowledge to determine a exact response.
Analyze (K4)	<ul style="list-style-type: none"> Analyzing the question is one that asks the students to break down something into its component parts. Analyzing requires students to identify reasons causes or motives and reach conclusions or generalizations.

Evaluate (K5)	<ul style="list-style-type: none"> • Evaluation requires an individual to make judgment on something. • Questions to be asked to judge the value of an idea, a character, a work of art, or a solution to a problem. • Students are engaged in decision-making and problem – solving. • Evaluation questions do not have single right answers.
Create (K6)	<ul style="list-style-type: none"> • The questions of this category challenge students to get engaged in creative and original thinking. • Developing original ideas and problem solving skills

8. Project

8.1. Project Report

A student should select a topic for the Project Work at the end of the third semester itself and submit the Project Report at the end of the fourth semester. The Project Report shall not exceed 40 typed pages in Times New Roman font with 1.5 line space.

8.2. Project Evaluation

There is a Viva Voce Examination for Project Work. The Guide and an External Examiner shall evaluate and conduct the Viva Voce Examination. The Project Work carries 100 marks (Internal: 25 Marks; External (Viva): 75 Marks).

9. Conversion of Marks to Grade Points and Letter Grade (Performance in a Course/Paper)

Range of Marks	Grade Points	Letter Grade	Description
90 – 100	9.0 – 10.0	O	Outstanding
80-89	8.0 – 8.9	D+	Excellent
75-79	7.5 – 7.9	D	Distinction
70-74	7.0 – 7.4	A+	Very Good
60-69	6.0 – 6.9	A	Good
50-59	5.0 – 5.9	B	Average
00-49	0.0	U	Re-appear
ABSENT	0.0	AAA	ABSENT

10. Attendance

Students must have earned 75% of attendance in each course for appearing for the examination. Student's with 71% to 74% of attendance must apply for condonation in the Prescribed Form with prescribed fee. Students with 65% to 70% of attendance must apply for condonation in the Prescribed Form with the prescribed fee along with the Medical Certificate. Students with attendance less than 65% are not eligible to appear for the examination and they shall re-do the course with the prior permission of the Head of the Department, Principal and the Registrar of the University.

11. Maternity Leave

The student who avails maternity leave may be considered to appear for the examination with the approval of Staff i/c, Head of the Department, Controller of Examination and the Registrar.

12. Any Other Information

In addition to the above mentioned regulations, any other common regulations pertaining to the PG Programmes are also applicable for this Programme.

13. Faculty Course File Structure-Contents

a.	Academic Schedule	q.	Laboratory Experiments related to the Courses
b.	Students Name List	r.	Internal Question Paper
c.	Time Table	s.	External Question Paper
d.	Syllabus	t.	Sample Home Assignment Answer Sheets
e.	Lesson Plan	u.	Three best, three middle level and three average Answer sheets
f.	Staff Work load	v.	Result Analysis (CO wise and whole class)
g.	Course Design (content, Course Outcomes (COs), Delivery method, mapping of COs with Programme Outcomes (POs), Assessment Pattern interms of Revised Bloom's Taxonomy).	w.	Question Bank for Higher studies Preparation(GATE/Placement)
h.	Sample CO Assessment Tools	x.	List of mentees and their academic achievements
i.	Faculty Course Assessment Report(FCAR)		
j.	Course Evaluation Sheet		
k.	Teaching Materials (PPT, OHP etc)		
l.	Lecture Notes		
m.	Home Assignment Questions		
n.	Tutorial Sheets		
o.	Remedial Class Record, if any		
p.	Projects related to the Course		

14. COMMON TEMPLATE FOR ALL PG PROGRAMMES AS PER TANSCH-2023-24

Semester-I	Credits	Hours	Semester-II	Credit	Hours	Semester-III	Credit	Hours	Semester-IV	Credit	Hours
1.1. Core-I	5	7	2.1. Core-IV	5	6	3.1. Core-VII	5	6	4.1. Core-XI	5	6
1.2 Core-II	5	7	2.2 Core-V	5	6	3.2 Core-VII	5	6	4.2 Core-XII	5	6
1.3 Core – III	4	6	2.3 Core – VI	4	6	3.3 Core – IX	5	6	4.3 Project with viva voce	7	10
1.4 Discipline Centric Elective -I	3	5	2.4 Discipline Centric Elective – III	3	4	3.4 Core – X	4	6	4.4 Elective - VI (Industry / Entrepreneurship) 20% Theory 80% Practical	3	4
1.5 Generic Elective-II:	3	5	2.5 Generic Elective -IV:	3	4	3.5 Discipline Centric Elective - V	3	3	4.5 Skill Enhancement course / Professional Competency Skill	2	4
			2.6 NME I	2	4	3.6 NME II	2	3	4.6 Extension Activity	1	
						3.7 Internship/ Industrial Activity	2	-			
	20	30		22	30		26	30		23	30
Total Credit Points -91											

15. Templates for Semesters
Choice Based Credit System (CBCS),
Learning Outcomes Based Curriculum Framework (LOCF) Guideline Based Credits
and Hours Distribution System
for all Post – Graduate Courses including Lab Hours

SEMESTER-I

S.No.	Course Code	List of Courses	Credits	Hours		CIA	ESE	Total
				L	P			
1.	P23NDT11	Core – I	5	7	-	25	75	100
2.	P23NDT12	Core–II	5	7	-	25	75	100
3.	P23NDP11	Core–III	4	6	-	25	75	100
4.	P23NDE1A/ P23NDE1B/ P23NDE1C	Elective–I(Discipline Centric)	3	5	-	25	75	100
5.	P23WSG11	Generic Course – I: Women Empowerment	3	5	-	25	75	100
Total			20	30		-	-	500

SEMESTER-II

S.No.	Course Code	List of Courses	Credits	Hours		CIA	ESE	Total
				L	P			
6.	P23NDT23	Core–IV	5	6	-	25	75	100
7.	P23NDT24	Core – V	5	6	-	25	75	100
8.	P23NDP22	Core–VI	4	6	-	25	75	100
9.	P23NDE2A / P23NDE2B/ P23NDE2C	Elective–III (Discipline Specific)	3	4	-	25	75	100
10.	P23CSG22	Generic Course – 2: Cyber Security	3	4	-	25	75	100
11.	P23NDS1A/ P23NDS1B/ P23NDS1C	NME - Skill Enhancement Course (SEC-1)-1	2	4	-	25	75	100
Total			22	30		-	-	600

M. Sc. NUTRITION AND DIETETICS-SYLLABUS

Semester wise

Structure

SEMESTER I

S. No.	Course Code	Course Components	Name of Course	Inst. Hours	Credits	Exam HRS	Max. Marks	
							CI A	External
1	P23NDT11	Core -I	Advanced Food Science	7	5	3	25	75
2	P23NDT12	Core -II	Human Physiology	7	5	3	25	75
3	P23NDP11	Core-III Practical-I	Advanced Food Science Practical	6	4	3	25	75
4	P23NDE1A/ P23NDE1B/ P23NDE1C	Elective –I (Discipline Specific)	(A)Human development and nutrition (B) Nutrition Counselling (C) Functional foods and nutraceuticals	5	3	3	25	75
5	P23WSG11	Generic Course - 1	Women Empowerment	5	3	3	25	75
Total Credits				30	20		600	

SEMESTER II

S .No.	Course code	Course Components	Name of Course	Inst. Hours	Credits	Exam HRS	Max. Marks	
							CI A	External
1	P23NDT23	Core -IV	Advanced Nutrition	6	5	3	25	75
2	P23NDT24	Core -V	Therapeutic Nutrition-I	6	5	3	25	75
3	P23NDP22	Core –VI Practical- II	Therapeutic Nutrition Practical	6	4	3	25	75
4	P23NDE2A/ P23NDE2B/ P23NDE2C	Elective –III	(A)Food Safety and Quality Control (B) Nutrition and Fitness (C) ICT Tools for Nutrition Education	4	3	3	25	75
5	P23CSG22	Generic Course-2	Cyber security	4	3	3	25	75
6	P23NDS1A/ P23NDS1B/ P23NDS1C	NME-I Skill Enhancement Course- 1	(A)Public Health Nutrition (B) Women and Health (C) Food Processing	4	2	3	25	75
Total				30	22		600	

Course Code	P23NDT11	SEMESTER I	YEAR-I	Credits	L	T	P	Hrs	
CORE I		ADVANCED FOOD SCIENCE		5	7	-	-	7	
Cognitive level	K1- Recall; K2 – Understand; K3 – Analyze; K4 – Apply;								
Learning Objectives	<ol style="list-style-type: none"> To understand the composition, classification, and function of various food groups. To analyze the factors affecting cooking and keeping quality of food. To identify the foods with their nutritional properties and the scope of the research in future foods. 								
Course Learning Outcomes	On successful completion of the course, the students will be able to								
	S. No	Outcomes					Domain of Learning		
							Cognitive		
							e		
	CO1	The importance of food groups based on the nutrient value to enable meal planning in cereals					K2		
	CO2	The scientific basis of preliminary of food: pulses and fruits					K2		
	CO3	Conservation of nutrients and acceptability of food preparation in egg and fish					K3		
CO4	Advanced food science in milk and oil.					K2			
CO5	The effect of processing and storage on the nutritional composition of sugar, beverages, and spices					K4			
Units	Course Contents								
Unit I	Food classification: cereals and pulses Food classification by ICMR, Food groups, Cereals - Rice & wheat and other Millets - Composition, Nutritive Value, and Processing. Role of starch and gluten in cookery. Pulses and legumes–Nutritive value, types, Processing, and anti-nutritional factors, factors affecting cooking quality, germination.								
Unit-II	Fruits and vegetables Fruits - Classification, Nutritive value, ripening of fruits, changes in ripening and pectic substances, browning. Vegetables: classification, nutritive values, processing, pigments, color changes, browning. Vegetable-based preserved foods.								
Unit-III	Milk and meat foods Milk - Classification, Nutritive value, Putrefaction, processing. Egg - Structure, Composition, Nutritive Value, and Role of egg in cookery. Meat - Structure, Composition, Nutritive value, Changes on cooking and Rigor mortis. Poultry - Composition, Nutritive value, changes in cooking. Fish - Composition, Nutritive value, Selection, Spoilage, Changes on Cooking. Fish processing and its advancements.								

Unit-IV	Fats and oils Fats and Oils – Types, properties of fat relating to cooking, Rancidity, Tests for rancidity, antioxidants used for rancidity, Hydrogenation, the role of fats in cookery.
Unit-V	a. Sugar cookery - Types of sugar, Properties, Crystallization, Stages in Sugar cookery, Application in Indian recipes. Artificial sweeteners: processing and safety measures of artificial sugar intake. b. Beverages –Basic Classification, Nutritive value, Preparation of milk-based beverages. Tea, coffee, cocoa processing, malted beverages, flavored drinks. Processing of beverages, recent developments in beverage processing. C .Spices and Condiments: production, nutrient contents, classification, processing of spices and condiments.
Textbook	1. Srilakshmi, M., Foodscience, New Age International (P) Ltd., Publishers 2010. 2. Swaminathan, M., Food Science, Chemistry and Experimental Foods, BapcoPublishers, 2005. 3. Sivasankar B, Food Processing and Preservation, Prentice-Hall of India Private Limited, New Delhi, 2002 4. Mehas, K.Y., and Rodgers, S. L., Food Science and You.Mcmillan Mcgraw HillCompany, 2000. 5. Potter, Norman N., and Joseph H. Hotchkiss. <i>Food science</i> . Springer Science &Business Media, 2012. 6. Manay S and Swamy S, Food Facts and Principles, New Age International (P) Ltd Publishers, New Delhi, 2001.
Reference Book	1. Brown. A. Understanding Food, Wadsworth, Thomson Learning Publications, 2000. 2. Mehas, K.Y., and Rodgers, S. L., Food Science and You. McMillan Mcgraw HillCompany, 2000. 3. Paul, P.C., and Palmer, H. H., Food Theory and Applications. John Wiley and Sons, New York, 2000 Revised Edition. 4. Fellows,P, Food Processing Technology-Principles and Practice.,2nd edition, CRC press WoodLead Publishing Ltd, Cambridge, England, 2000. 5. Vaclavik, Vickie A., Elizabeth W. Christian, and Elizabeth W. Christian. <i>Essentials of food science</i> . Vol. 42. New York: Springer, 2008.
E-Reference	1. The American journal of clinical nutrition

Mapping of Cos with POS & PSOs

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	S	S	S	S	M	S	S	S	M	M	S	M
CO2	S	S	S	S	M	S	S	S	M	M	S	M
CO3	S	S	S	S	M	S	S	S	M	M	S	M
CO4	S	S	S	S	M	S	S	S	M	M	S	M
CO5	S	S	S	S	M	S	S	S	M	M	S	M

Strongly Correlating (S) -3 Marks Moderately Correlating (M)- 2 marks

Weakly Correlating (W) -1 Mark No Correlation (N) - 0 mark

Course Code	P23NDT12	SEMESTER I	YEAR-I	Credits	L	T	P	Hrs
CORE-II		HUMAN PHYSIOLOGY		5	7	-	-	7
Cognitive level	K1- Recall; K2 – Understand; K3 – Analyze; K4 – Apply;							
Learning Objectives	The main objectives of this course are to: <ul style="list-style-type: none"> To aid the students to conquer knowledge about the various physiological structure and functions of the human body. To integrate the functions of all the systems and disease conditions. 							
Course Learning Outcomes	On successful completion of the course, the students will be able to							
	S. No	Outcomes						Domains of Learning Cognitive
	CO1	Cellular science and the human digestive system						K2
	CO2	Respiratory functions and excretory system functions						K4
	CO3	Immune system and role of the digestive system						K2
	CO4	Endocrine and reproductive system						K1
	CO5	Nervous system and sensory organs						K2
	CO6	Cellular science and the human digestive system						K2
	Course Contents							
Unit I	Cell components Cellular basis of Physiology - Body fluid compartment, membrane potential, cell structure, and functions - Regulation of cell multiplication. Digestive System: Review of structure and function of various parts in the gastrointestinal tract in brief. Role of liver, pancreas, gall bladder and their dysfunction. Role of specific hormones associated in GI tract.							

Unit-II	<p>Respiratory system Review of structure and functions. Role of lungs in the exchange and transport of gases. Respiratory volumes</p> <p>Excretory System: Anatomy and physiology of kidneys and nephron. Formation of urine, acid-base balance, Role of the kidney in maintaining pH of the blood.</p>	
Unit-III	<p>Immune System Immunity - Properties, natural and acquired Immunity, features of immune responses, antigen - antibodies - types, properties, and antigen-antibody interaction, Autoimmune disorder and allergy.</p> <p>Circulatory System: Structure and function of the heart and blood vessels. Blood: Composition- plasma, blood cells, haemoglobin, blood clotting process. Regulation of cardiac output, cardiac cycle, blood pressure.</p>	
Unit-IV	<p>Endocrine system Anatomy and physiological functions of endocrine glands: Hormones - Mode of action - Pituitary, Adrenal, Thyroid, Parathyroid, Sex glands, and Pancreas. Hypo and Hyper activities of the glands.</p> <p>Reproduction System: structure, physiological functions of male and female reproductive organs, menstrual and ovarian cycle, spermatogenesis, contraceptives, infertility and its recent developments, Rh factor.</p>	
Unit-V	<p>Nervous system: Review of CNS & ANS, the function of neuron, conduction of nerve impulse, synapse, the role of neurotransmitters. The blood-brain barrier, CSF. Hypothalamus and its role in various body functions –sleep, memory, and obesity.</p> <p>Sense organs: Review of structure and function skin, eye, ear, nose, and tongue in the perception of stimuli.</p>	
Text Book	<ol style="list-style-type: none"> 1. Sembulingam, Kirma, and Prema Sembulingam. <i>Essentials of medical physiology</i>. JP Medical Ltd, 2012. 2. Ashalatha, P. R., and G. Deepa. <i>Textbook of Anatomy & Physiology for Nurses</i>. JP Medical Ltd, 2012. 3. Chatterjee CC, Human Physiology, Volume I, 11th Edition, CBS Publishers, New Delhi, 2016. 4.Sathya P and Devanand V, Textbook of Physiology, First edition, CBS Publishers and Distributors Pvt Ltd, New Delhi, 2013 	

Reference Book	<p>1. Ganong, WF, Review of Medical Physiology, 21st Edition, McGraw Hill Publishers, 2003</p> <p>2. Guyton AC & Hall JE, Textbook of Medical Physiology, 10th Edition, Harcourt Asia P. Ltd Singapore, 2001</p> <p>3. Subrahmanyam, Sarada, K. Madhavankutty, and H. D. Singh. <i>Textbook of human physiology</i>. S. Chand Publishing, 1987.</p> <p>4. Boron WF and Boulpaep EL, Medical Physiology, 11th Edition, Saunders Elsevier, 2009</p> <p>5. Marieb EN, Human Anatomy and Physiology, VI edition, Pearson edition, 2004</p> <p>6. Tortora. G & Grabowski, S.R. Principles of Anatomy & Physiology, 10th Edition, John Wiley & Sons, USA, 2003</p>	
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Mapping of Cos with POS & PSOs

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	M	S	M	S	S	S	M	S	M	S	S	M
CO2	M	S	M	S	S	S	M	S	M	S	S	M
CO3	M	S	M	S	S	S	M	S	M	S	S	M
CO4	M	S	M	S	S	S	M	S	M	S	S	M
CO5	M	S	M	S	S	S	M	S	M	S	S	M

Strongly Correlating (S) - 3 Marks
 Moderately Correlating (M) - 2 marks
 Weakly Correlating (W) - 1 Mark
 No Correlation (N) - 0 mark

Course Code	P23NDP11	SEMESTER I	YEAR-I	Credits	L	T	P	Hrs	
CORE-III PRACTICAL- I		ADVANCED FOOD SCIENCE PRACTICAL		4	-	-	6	6	
Cognitive level	K3 - Apply; K4 –Analyze; K6 – Create;								
Learning Objectives	The main objectives of this course are <ol style="list-style-type: none"> 1. Do various food evaluation methods for the determination of food constituents 2. Understand the processing conditions on physicochemical properties of food constituents during food processing. 								
Course Learning Outcomes	On successful completion of the course, the students will be able to								
	S. No	Outcomes						Domains of Learning Cognitive	
	CO1	Food evaluation techniques.						K3	
	CO2	Various cookery methods and their evaluation procedures in cereals, pulses, and vegetable cookery.						K4	
	CO3	The cooking principles on meat and poultry						K3	
	CO4	The smoking point of different fats and oils.						K4	
	CO5	Various sugar-based recipes food analytical techniques on sugar and milk cookery.						K6	
Course Contents									
I	<ol style="list-style-type: none"> 1. Food Evaluation:- Organoleptic evaluation with different scales. 2. Cereal cookery – Dextrinization, caramelization, and gelatinization. Study the development of gluten, water holding capacity. 3. Pulse cookery-Effects of soaking, acid, alkali, and sprouting and different methods of cooking- on-cooking time and quality of pulses. 4. Fruits and vegetable cookery-Effect of acid, alkali, and methods of cooking on pigments. Browning reactions in fruits and vegetables. 5. Egg, meat, fish, poultry–Egg foaming, egg coagulation, effect of temperature on egg coagulation, study of cooking time on different types of meat. 6. Fats and oils-Smoking point of different fats and oils, rancidity assessment. 								

	<p>7. Sugar cookery-Stages of sugar cookery, uses of sugar in Indian recipes Crystallization and factors affecting crystallization.</p> <p>8. Milk cookery-effect of acid, salt, heat on milk proteins, fermentation techniques.</p>	
Text Book	<p>1."Food Analysis" by S. Suzanne Nielsen</p> <p>2."Food Processing Technology: Principles and Practice" by P.J. Fellows</p> <p>3."Food Chemistry" by Owen R. Fennema</p>	
Reference Book	<p>1."Introduction to Food Engineering" by Paul Singh and Dennis R. Heldman.</p> <p>2.Experimental Food Science" by Mary D. Schmidl and Theodore P. Labuza</p> <p>3. "Sensory Evaluation Techniques" by Morten C. Meilgaard, Gail Vance Civille, and B. Thomas Carr</p>	

Mapping of Cos with POS & PSOs

CO/ PO	PO1	PO 2	PO3	PO 4	PO 5	PO 6	PO 7	PS O1	PS O2	PS O3	PS O4	PS O5
CO1	S	S	S	S	M	M	S	S	M	M	S	S
CO2	S	S	S	S	M	M	S	S	M	M	S	S
CO3	S	S	S	S	M	M	S	S	M	M	S	S
CO4	S	S	S	S	M	M	S	S	M	M	S	S
CO5	S	S	S	S	M	M	S	S	M	M	S	S

Strongly Correlating (S)	-	3 Marks
Moderately Correlating (M)	-	2 marks
Weakly Correlating (W)	-	1 Mark
No Correlation (N)	-	0 mark

Course Code	P23NDE1A	SEMESTER I	YEAR-I	Credits	L	T	P	Hrs
ELECTIVE I Discipline Centric		HUMAN DEVELOPMENT AND NUTRITION		3	5	-		5
Cognitive level	K1- Recall; K2 – Understand; K3 – Analyze; K4 – Apply;							
Learning Objectives	<p>The course aims to</p> <ul style="list-style-type: none"> To know the importance of nutrition during life span and also to enlighten on the RDA and dietary modifications for different age groups. Develop aptitude to learn the stages of growth and development of different age groups To familiarize the theories of growth and development of all ages. 							
Course Learning Outcomes	On successful completion of the course, the students will be able to							
	S. No	Outcomes					Domain of Learning	
							Cognitive	
							e	
	CO1	The importance of food groups based on the nutrient value to enable meal planning in cereals					K2	
	CO2	The scientific basis of preliminary of food: pulses and fruits					K2	
	CO3	Conservation of nutrients and acceptability of food preparation in egg and fish					K3	
CO4	Advanced food science in milk and oil.					K2		
CO5	The effect of processing and storage on the nutritional composition of sugar, beverages, and spices					K4		
Units	Course Contents							
Unit I	<p>Recommended Allowances</p> <p>a) RDA for Indians, Estimated Average Requirements, Computation of Allowance based on Energy Expenditure, Components of Energy Expenditure.</p> <p>Nutrition in Pregnancy:</p> <p>a) Physiology of Pregnancy</p> <p>b) Stages of Gestation, Maternal Weight Gain</p> <p>c) Nutritional requirements and dietary guidelines during Pregnancy</p> <p>d) High risk Pregnancies and Complications during Pregnancy</p> <p>e) Role of Exercise & Fitness during Pregnancy</p>							

Unit-II	<p style="text-align: center;">Nutrition during Lactation</p> <p>a) Breast feeding biology, Psycho - physiological aspects of Lactation, Factors affecting Lactation Capacity. b) Nutritional requirements & Dietary Guidelines c) Galactogogues d) Lactation Management in Normal & Special conditions e) Effect of Breast Feeding on Maternal Health</p> <p>Nutrition in Infancy a) Growth and Development and Nutrient Needs b) Infant feeding, Volume and Composition of Breast Milk, Human Milk Vs. Artificial Formula. c) Weaning Foods and Feeding Problems d) Common Nutrition Problems e) Preterm and LBW infants: Consequences, Implications for Feeding and Management</p>	
Unit-III	<p style="text-align: center;">Nutrition in Childhood</p> <p>a) Growth and Development – Stage, Theories – Maturation is theory, Behaviorist theory, Erikson’s psycho analytical theory, Piagets cognitive theory, Vygotsky’s theory. b) Nutritional requirements for Preschool and School Children c) Micronutrient Malnutrition among Preschool Children d) Nutrition for Special Children- Autism e) Feeding Problems f) Healthy food choices during Childhood g) Factors to be considered for planning a School Lunch.</p>	
Unit-IV	<p style="text-align: center;">Adolescence</p> <p>a) Growth and Development – Stages, Theories – Freud’s psychosexual stage theory, Kohlberg’s moral understanding stage theory, and Bronfenbrenner’s ecological theory. b) Physiological and Psychological changes c) Nutritional requirements of Adolescents d) Nutritional issues and eating disorders in Adolescence</p> <p>Adulthood a) Physiological and Psychosocial changes b) Common Nutritional Concerns and Diet c) Nutritional requirements for Adult Man and Woman d) Physical Activity in Adulthood</p>	
Unit-V	<p style="text-align: center;">Geriatric Nutrition</p> <p>- The aging process - Physiological, biochemical, and body composition changes. - Socio-psychological aspects of ageing - Special problems of the elderly.</p>	

	Nutritional requirements of the elderly & dietary management to meet nutritional needs	
Textbook	<ol style="list-style-type: none"> 1. Brown, J. E-Nutrition through the Life Cycle, 6 edn, 2016, Cengage Learning. 2. Mahan L. K. & Stump S.E Krause's - Food Nutrition and diet Therapy, 11edn, 2003, Saunders. 3. B.Srilakshmi - Nutrition Science, 2006, New Age International. 4. Groff, J. L and Gropper, S. S- Advanced Nutrition and Human Metabolism, Belmont CA: Wadsworth/Thomson Learning. 5. Goodhart, R. S. S. and Shils, M. E - Modern Nutrition in Health and Disease, Philadelphia: Lea and Febiger. 	
Reference Book	<ol style="list-style-type: none"> 1. Robinson Ch., M.B. Lawlea, W.L., Chenoweth, And A.E., Carwick : Normal And Therapeutic Nutrition, 17th Edn, Macmillan Publishing Company. 2. Krause's., Kathleen Mahan., Marian T. Arlin: Food Nutrition & Diet Therapy, 8th Edition 1992, W.B. Saunders Company. 3. Jackson, M. S - Adolescent Nutritional Disorders, 1997, The New York Academy of Science. 5. Jellife D.B- Assessment of Nutrition Status of the Community, 1966, WHO, Geneva 	
E-Reference	World Health Organization (WHO)- Nutrition UNICEF-Nutrition	

Mapping of Cos with POS & PSOs

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	S	S	M	M	S	S	M	S	M
CO2	S	S	M	S	S	M	M	S	S	M	S	M
CO3	S	S	M	S	S	M	M	S	S	M	S	M
CO4	S	S	M	S	S	M	M	S	S	M	S	M
CO5	S	S	M	S	S	M	M	S	S	M	S	M

Strongly Correlating(S)
Weakly Correlating(W)

3 Marks
1 Mark

Moderately Correlating(M)
No Correlation(N)

2 Marks
0 Mark

Course Code	P23NDE1B	SEMESTER I	YEAR-I	Credits	L	T	P	Hrs
ELECTIVE I		NUTRITION COUNSELING		3	5	-	-	5
Discipline Centric								
Cognitive level	K1- Recall; K2 – Understand; K3 – Analyze; K4 – Apply;							
Learning Objectives	<p>The course aims to</p> <ul style="list-style-type: none"> To enable students gain knowledge on counseling process To familiarize with counseling skills. To enable students gain knowledge on health psychology and health behavior To apprehend on skills of stress management. 							
Course Learning Outcomes	On successful completion of the course, the students will be able to							
	S. No	Outcomes					Domain of Learning	
							Cognitive	
							e	
	CO1	Understand the fundamentals of nutrition					K2	
	CO2	Apply nutrition knowledge to dietary assessment					K1	
	CO3	Design personalized nutrition plans					K1	
CO4	Analyze and interpret nutritional data					K4		
CO5	Demonstrate counselling and communication skills					K2		
Units	Course Contents							
Unit I	<p>I Counseling process</p> <p>a) Counseling – Definition, Expectations, Goals, Scope and Limits. Counsellor – Characteristics of an effective counsellor. The Client– Characteristics, Expectations</p> <p>b) Stages in Counseling – Establishing Rapport • Understanding and Assessing the Problem • Goal Setting • Counseling Intervention Strategies • Termination and Follow up</p> <p>c) Ethics in Counseling</p>							
Unit-II	<p>Counseling Approaches: Key Concepts and Techniques</p> <p>a) Counseling techniques, Strategies and Counseling skills- Rapport building and Opening techniques, Questioning, Listening, Reflecting, Acceptance, Silence, Leading reassurance, Non-verbal behavior, Terminating skills.</p> <p>b) Group Counseling.</p>							

	d) Common Nutrition Problems e) Preterm and LBW infants: Consequences, Implications for Feeding and Management	
Unit-III	Nutrition counseling a) Definition, History, Theories – Behavior modification (Cognitive Behavior therapy, Rational- Emotive therapy, Dis-inhibition), Standard behavioral therapy, Social learning theory, Tran theoretical model, and Person-centered therapy. b) Counseling skills to facilitate self- Management- Stages of change- Pre-contemplation, Contemplation, Preparation, Action, Maintenance and Relapse and Motivational interviewing	
Unit-IV	Health Psychology and Health Behavior a) Health Psychology- Health Behavior- Definition of Health Psychology. The Need for Health Psychology, Introduction to Health Behavior, Factors Influencing the Practice of Health. b) Modification of Health Behavior – The Patient/Practitioner relationship, Changing Health Behavior by Changing Health Beliefs, Cognitive Behavioral Approaches to Health Behavior Change, Appropriate Venue for Health Habit Modification	
Unit-V	Stress Management and Health Care Intervention a) Stress and Stress Management- Definition of stress, Categories of stressors, Predisposing factors, Effects of Stress: GAS, Type A behavior and stress, Methods of Coping with stress b) Health Care Intervention and Prevention- Health enhancing behavior – Diet, Exercise, Weight control, Yoga, Meditation, Development of Healthy Life Style, Quality of life, Influence of health settings on patient behavior – Out-patient, In-patient, Aftercare, and Home based care.	
Textbook	<ul style="list-style-type: none"> • GPH panel of experts (2018), Counseling Psychology Notes, Gullybaba Publishing House (P) Ltd. • Isobel R. Conteno. 2011. Nutrition Education. Linking Research, Theory and Practice, Second Edition, Jones and Barlett publishers, Canada 	
Reference Book	<ul style="list-style-type: none"> • David F Marks, Michael Murray, Brian Evans, Carla Willig, Cailine Woodall and Catherine M. Sykes, Health Psychology: Theory, Research and Practice. 2nd edition. New Delhi: Sage Publications, 2008. • Shelley E. Taylor. Health Psychology. 6th edition. Tata McGraw Hill edition, 1995. Edward P. Sarafino. Health Psychology. Joha Wiley and Sons, 1994. 	

E-Reference	• https://basicmedicalkey.com/patient-counseling-settings-and – techniques
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Mapping of Cos with POS & PSOs:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	M	M	S	S	M	M	S	S
CO2	S	S	S	S	M	M	S	S	M	M	S	S
CO3	S	S	S	S	M	M	S	S	M	M	S	S
CO4	S	S	S	S	M	M	S	S	M	M	S	S
CO5	S	S	S	S	M	M	S	S	M	M	S	S

Strongly Correlating(S)	-	3Marks
Moderately Correlating (M)	-	2Marks
Weakly Correlating (W)	-	1Mark
No Correlation (N)	-	0Mark

Course Code	P23NDE1C	SEMESTER I	YEAR-I	Credits	L	T	P	Hrs
ELECTIVE I Discipline Centric		FUNCTIONAL FOODS AND NUTRACEUTICALS		3	5	-	-	5
Cognitive level	K1- Recall; K2 – Understand; K3 – Analyze; K4 – Apply;							
Learning Objectives	The course aims to <ul style="list-style-type: none"> ➤ Knowledgeable about specific issues concerning functional foods and nutraceuticals ➤ Understanding the use of various functional foods in therapeutic conditions ➤ To develop diet supplements incorporating functional foods Practicing the effect of each food and its effect on health							
Course Learning Outcomes	On successful completion of the course, the students will be able to							
	S. No	Outcomes					Domain of Learning Cognitive	
	CO1	The growing importance of Nutraceuticals and functional foods					K1	
	CO2	The role of functional foods in health					K2	
	CO3	The commercial food supplements and their occupation in the market					K2	
	CO4	The functional assessment of foods					K3	
	CO5	Nutraceuticals and functional foods on health.					K2	
Units	Course Contents							
Unit I	Functional foods and Nutraceuticals Functional foods and Nutraceuticals – Introduction – Defining, the concept – Review of the history of functional foods – technology of Nutraceuticals – primary and secondary metabolites in plants general teleology – a) Carotenoids b) Conjugated linolenic acid c) Flavonoids d) Nitrogen and Sulphur containing Amino acid derivatives e) proteinase and alpha-amylase inhibitors f)Omega – 3 PUFA g) Terpenoids.							
Unit-II	Classifying Nutraceuticals Organizational models for Nutraceuticals Classifying Nutraceuticals Organizational models for Nutraceuticals: a) Food source – Plant: Soya, olive oil, plant steroids, tea, grapevine,							

	<p>garlic, capsicum, dietary fiber, and other fruits.</p> <p>b) Animal: Milk and products, meat, fish. Microbial probiotics.</p> <p>c) Mechanism of action – Anticancer, positive influence on blood lipid profile, anti-oxidation, anti-inflammatory, osteogenesis.</p> <p>d) Chemical nature – Isoprenoid derivatives, phenolic substances, fatty acids, and structural lipids, carbohydrates and derivatives, amino acid-based substances, microbes, minerals.</p>	
Unit-III	<p>Dietary supplements</p> <p>Regulation of dietary supplements – Types – inborn errors of metabolism, - obesity, neurological disorder, diabetes mellitus, hypertension vitamin A deficiency, protein energy malnutrition, anemia, Instant foods, and formulas supplement soups, Herbal, and Flowers as functional foods.</p>	
Unit-IV	<p>Bioavailability of nutrients</p> <p>Bioavailability of nutrients in different foods; measurement of functional component and their bioavailability. Need for measurement, safety quality assurance, and cost bioavailability: definition, factor affecting, chemical measurement and physical testing and microbiological testing- functional foods and vitro studies.</p>	
Unit-V	<p>Nutrigenomics</p> <p>Pharmacology and Nutraceuticals pharmacology of chemical components derived from a plant source and the therapeutic efficiency of functional food ingredients. Nutrigenomics relationships between nutritional supplementation and gene expression and disease prevention. Dietary supplements.</p>	
Textbook	<ul style="list-style-type: none"> • Mary K. Schmidl and Theodore P. Labuza, "Essentials of Functional Foods," Culinary and Hospitality Industry Publication Services, 2000. • Israel Goldberg, "Functional Foods, Pharmafoods, Nutraceuticals," Culinary and Hospitality Industry Publication Services, 2001. • Robert E. Wildman, "Handbook of Nutraceuticals and Functional Foods," Culinary and Hospitality Industry Publication Services, 2001. 	
Reference Book	<ul style="list-style-type: none"> • Paresh C. Dutta, "Phytosterols as Functional Food Components and Nutraceuticals," Marcel Dekker Inc, New York, 2004. 	

	<ul style="list-style-type: none"> • Jeffery Horst, "Methods of Analysis for Functional Foods and Nutraceuticals," CRS Press, 2002. • Webb G. P., "Dietary Supplements and Functional Foods," New York: Blackwell Publishing Ltd, 2006. • Wildman R. E. C., "Handbook of Nutraceuticals and Functional Foods," London: CRC Press, Taylor, and Francis, Boca Raton, 2007. • Gibson G. R. & William C. M., "Functional Foods - Concept to Product," 2000. • Goldberg I., "Functional Foods: Designer Foods, Pharma Foods," 2004. • Brigelius-Flohé, J. & Joost H. G., "Nutritional Genomics: Impact on Health and Disease," Wiley VCH, 2006. • Cupp J. & Tracy T. S., "Dietary Supplements: Toxicology and Clinical Pharmacology," Humana Press, 2003.
E-Reference	Functional foods center

Mapping of Cos with POS & PSOs

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	S	S	M	M	S	S	M	M	S	S
CO2	S	M	S	S	M	M	S	S	M	M	S	S
CO3	S	M	S	S	M	M	S	S	M	M	S	S
CO4	S	M	S	S	M	M	S	S	M	M	S	S
CO5	S	M	S	S	M	M	S	S	M	M	S	S

Strongly Correlating(S)

3 Marks

Weakly Correlating(W)

1 Mark

Moderately Correlating(M)

2 Marks

No Correlation(N)

0 Mark

Course Code	P23NDT23	SEMESTER II	YEAR-I	Credits	L	T	P	Hrs
CORE -IV		ADVANCED NUTRITION		5	6	-	-	6
Cognitive level	K1- Recall; K2 – Understand; K3 – Analyze; K4 – Apply;							
Learning Objectives	<p>The course aims to</p> <ol style="list-style-type: none"> 1. The essential of nutrients in the growth and development of humans 2. The importance of nutrients in maintaining human health and leading an active lifestyle 							
Course Learning Outcomes	On successful completion of the course, the students will be able to							
	S. No	Outcomes					Domain of Learning	
							Cognitive	
	CO1	The methods to determine body composition					K2	
	CO2	The current trends in the area of human nutrition requirements the methods of determining nutrient requirements and current figures of nutritional requirements.					K1	
	CO3	Advances in the field of energy, carbohydrate, lipid, and protein nutrition.					K2	
	CO4	Facts on nutrients and their requirements.					K5	
CO5	Functional foods and their applications					K2		
Units	Course Contents							
Unit I	<p>Human energy requirements</p> <p>Total energy expenditure-Basal Metabolic Rate, Physical activity, SDA</p> <ul style="list-style-type: none"> • Components of energy requirements. • Factors affecting energy expenditure and requirements: the thermal effect of food, energy expended in physical activity. <p>Carbohydrates:</p> <p>Classification (available and unavailable), sources, digestion, absorption, metabolic utilization functions, and regulation of blood glucose concentration.</p> <p>Dietary fiber: Classification of dietary fiber, physiological effects, potential health benefits, recommended intake and sources</p>							

Unit-II	Proteins a. Functions, classification, sources, RDA, Digestion, absorption, utilization and storage, b. Evaluation of protein quality. Essential and non-essential amino acids, Amino acid balance, imbalance, and toxicity. Lipids: - Functions, classification, sources, RDA -Digestion, absorption, utilization, and storage. - Transport and storage of fats in the body. - Lipoproteins.	
Unit-III	Fat-soluble vitamins and water soluble vitamins Chemistry, Functions, Physiological action, Digestion, Absorption, Utilization, Transport, Storage, Excretion, Source, RDA, Deficiency, Diagnosis of deficiency, Toxicity, Interaction of fat-soluble vitamins with other nutrients. Hypo and hyper vitaminosis.	
Unit-IV	Macro and micro Minerals: Macro Minerals: Calcium, Phosphorous, Magnesium, Sodium, Potassium, Chloride: biological importance, Distribution in the body, digestion, absorption, Utilization, transport, excretion, deficiency, toxicity, food sources, RDA, Regulation of calcium concentration, commercial nutrient supplementation.	
Unit-V	Water, antioxidants and free radicals Water: composition of body fluids extra- and intra- cellular fluid; Physiological functions; water balance and its regulation; Requirement and the sources; Nutritional and health problems due to deficiency or excess of water intake. Antioxidants and Free Radicals: Antioxidants and free radicals: definition, importance, functions, food sources, mechanism of free radical formation. Role of vitamins and minerals as antioxidants Role of oxygen free radicals. Role of antioxidants in degenerative diseases.	
Textbook	1. Krause, M. V and Hunsher, M. A, Food, Nutrition and Diet Therapy, 11th edition, W.B. Saunders company, Philadelphia, London,2007.	

	<p>2. Advanced Nutrition: Macronutrients, Micronutrients, and Metabolism Carolyn D. Berdanier (Author), Lynnette A. Berdanier, Janos Zempleni Edition: 12008.</p> <p>3. Recommended dietary allowances, ICMR, National Institute of Nutrition, Hyderabad,2010.</p>
Reference Book	<p>1. Swaminathan. Advanced Textbook on Food Science and Nutrition, Vol:2, Second edition, Reprinted, Bangalore Printing and Publishing Co Inc, Bangalore,2012.</p> <p>2. Sri Lakshmi, Nutrition Science, New Age International (Pvt) Ltd, New Delhi, 4th edition2012.</p> <p>3. Maurice Edward Shils, Moshe. Shike Modern Nutrition in Health and Diseases 10th edition 2006.</p> <p>4. Wahlqvist, Mark L. "The new nutrition science: sustainability and development." <i>Public Health Nutrition</i> 8, no. 6a (2005):766-772.</p>
E-Reference	https://nutrition.org/

Mapping of Cos with POS & PSOs

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	M	S	S	M	S	S	M	S	M
CO2	S	S	M	M	S	S	M	S	S	M	S	M
CO3	S	S	M	M	S	S	M	S	S	M	S	M
CO4	S	S	M	M	S	S	M	S	S	M	S	M
CO5	S	S	M	M	S	S	M	S	S	M	S	M

Strongly Correlating(S)	-	3Marks
Moderately Correlating (M)	-	2Marks
Weakly Correlating (W)	-	1Mark
No Correlation (N)	-	0Mark

Course Code	P23NDT24	SEMESTER II	YEAR-I	Credits	L	T	P	Hrs
CORE V		THERAPEUTIC NUTRITION - I		5	6	-	-	6
Cognitive level	K1- Recall; K2 – Understand; K3 – Analyze; K4 – Apply;							
Learning Objectives	<p>The course aims to</p> <p>1. Provide exposure to the study of aetiology, symptoms, and medical nutrition therapy in various diseases.</p> <p>2. Learn the method to plan and prepare a diet for various diseases.</p>							
Course Learning Outcomes	On successful completion of the course, the students will be able to							
	S. No	Outcomes					Domain of Learning Cognitive	
	CO1	Plan and prepare a standardized hospital diet for the needed patients.					K2	
	CO2	Select specific foods for management for obesity and underweight.					K2	
	CO3	Apply nutrition principles to health promotion and the prevention of gastrointestinal diseases.					K3	
	CO4	Compare the food exchange list in the control of diabetes and complications					K2	
CO5	Identify the relationship between diet and cardiovascular disease.					K4		
Units	Course Contents							
Unit I	<p>Therapeutic diets</p> <p>Definition - Introduction - Types - routine hospital diet - clear fluid, full-liquid and soft diets, Pre- and Post-operative diet. Regular normal diet. Special feeding methods-tube feeding - types of food- food requirements- parental feeding. TPN formula for children, adolescents.</p>							
Unit-II	<p>Diet in Obesity & Underweight:</p> <p>a) Dietary management in Obesity: b) Etiology, Classification, and Energy balance c) Physiology of the obese state & Clinical manifestations d) Risk factors, Complications, and Lifestyle modifications e) Nutraceuticals and Dietary management</p>							

	<p>f) Dietary management in Underweight: g) Etiology and dietary management in eating disorders h) Definition, Signs, and symptoms, Complications/health risks i) Diagnostic criteria and nutrition management in Anorexia Nervosa and Bulimia Nervosa</p>	
Unit-III	<p>Diet in Febrile condition & Gastrointestinal Diseases: Classification and etiology of fever/infection, symptoms, diagnostic tests, Metabolic changes during infection, and dietary treatment for - Typhoid, Influenza, Malaria, Tuberculosis, and HIV and AIDS. GI disorders- etiology, symptoms, and medical nutrition therapy for Peptic ulcer, Constipation, Diarrhea.</p>	
Unit-IV	<p>Diet in Diabetes Mellitus Dietary management of Diabetes mellitus a) Prevalence, Types, A etiology, and Signs and Symptoms b) Factors affecting normal blood glucose levels c) Impaired glucose homeostasis d) Diagnostic test for diabetes e) Complications of diabetes - macro-vascular and micro-vascular Management of Diabetes a) Food exchange list, b) Glycaemic index of foods, Carbohydrate counting, and Resistant starch c) Sweeteners and sugar substitutes d) Meal planning approaches - With and without Insulin and during sickness. e) Medications - Oral hypoglycemic drugs and Insulin. f) Lifestyle modification and exercise to manage diabetes mellitus.</p>	
Unit-V	<p>Diet in Cardiovascular Diseases: Diet in Cardiovascular Diseases a) Prevalence, Clinical effects b) Risk factors, Role of fat in the development of atherosclerosis c) Dietary management d) Hyper tension e) Physical activity and heart diseases f) Fat substitute. Hypertension – etiology, symptoms, medical nutrition therapy</p>	
Textbook	<ol style="list-style-type: none"> 1. Robinson, Corinne Hogden, and Marilyn R. Lawler. <i>Normal and therapeutic nutrition</i>. No. Ed. 16. Collier Macmillan Publishers, 1982. 2. Dietary Guidelines of Indians- A Manual, National Institute of Nutrition, Hyderabad, 2006. 3. Srilakshmi B, Dietetics, sixth edition, New age Publishing Press, New Delhi, 2011 4. Stacy N, William's Basic Nutrition and Diet Therapy, 12th edition, Elsevier publications, UK, 2005. 5. Elia M, Ljungqvist O, Stratton RJ, Lanham SA, Clinical Nutrition (The Nutrition Society Textbook), 2nd edition, Wiley Blackwell Publishers, 2013 6. Mahan LK, Stump SE, and Raymond JL, Krause's Food and Nutrition Care Process, 13th Edition, Elsevier Saunders, Missouri, 2012 	

	7. Stump SE, Nutrition and diagnosis related care, 7th edition, Lippincott Williams and Wilkins, Canada, 2012.
Reference Book	<ol style="list-style-type: none"> 1. Gopalan C., Ramanathan, P.V. Balasubramanian, S.C., Nutritive value of Indian foods, NIN, Hyderabad, 2010. 2. Srilakshmi B, Dietetics, sixth edition, New age Publishing Press, New Delhi, 2011. 3. Marian M et al., Clinical Nutrition for surgical patients, Jones and Bartlett Publishers, Canada, 2008. 4. Joshi Y.K, Basics of Clinical Nutrition, 2nd edition, JP Medical Publishers Pvt Ltd, New Delhi, 2008. 5. Stacy N, William's Basic Nutrition and Diet Therapy, 12th edition, Elsevier publications, UK, 2005. 6. Gibney MJ, Elia M, Ljungqvist O, Clinical Nutrition (The Nutrition Society Textbook) Wiley Blackwell Publishers, 2005 7. Whitney EN and Rolfes SR, Understanding Nutrition, 9 th edition, West/Wordsworth, 2002 8. Guthrie H, Introductory Nutrition, CV Mosby Co.St. Louis, 2002 9. Williams SR, Nutrition & Diet Therapy, CV. Mosby St. Louis, 2001 10. Garrow et al, Human Nutrition & Dietetics, 10th Edition, Churchill Livingstone, 2001
E-Reference	https://www.eatright.org/

Mapping of Cos with POS & PSOs:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	M	S	S	S	M	M	S	M
CO2	S	S	S	S	M	S	S	S	M	M	S	M
CO3	S	S	S	S	M	S	S	S	M	M	S	M
CO4	S	S	S	S	M	S	S	S	M	M	S	M
CO5	S	S	S	S	M	S	S	S	M	M	S	M

Strongly Correlating (S) - 3 Marks

Moderately Correlating (M) - 2 marks

Weakly Correlating (W) - 1 Mark

No Correlation (N) - 0 mark

Course Code	P23NDP22	SEMESTER II	YEAR-I	Credits	L	T	P	Hrs
CORE VI Practical-II	THERAPEUTIC NUTRITION PRACTICAL – I			4	-	-	6	6
Cognitive level	K1- Recall; K2 – Understand; K3 – Analyze; K4 – Apply;							
Learning Objectives	The course aims to <ul style="list-style-type: none"> ➤ The students will be able to plan a day’s menu based on the person/patient's disease condition. ➤ The students will be able to prepare a nutritious/ hospital/pediatric diet. 							
Course Learning Outcomes	On successful completion of the course, the students will be able to							
	S. No	Outcomes					Domain of Learning	
							Cognitive	
							e	
	CO1	Various disorders and their complications					K1	
	CO2	Different types of therapeutic diet.					K6	
	CO3	The dietary measures to reduce/prevent the disease.					K3	
CO4	The hands-on experience in therapeutic nutrition and its planning.					K5		
CO5	Learn the diet counseling process					K2		
Units	Course Contents							
Unit I	Routine hospital diet Routine hospital diet, importance of hospital diets, types of diet - Full liquid, clear liquid, soft, light, bland, and regular diet. Different types of diseases, conditions, and its variations. Diet for: Obesity, underweight: menu planning, preparation, standardization, sensory analysis, nutrient calculation, and cost calculation.							
Unit-II	Diet for gastrointestinal diseases: Diet in gastrointestinal disorders – lower and upper GI diseases, peptic ulcer, pancreatitis, diarrhea, constipation. Diet in liver disorders - jaundice, cirrhosis, hepatic coma, fatty liver, and gallstones: menu planning, preparation, standardization, sensory analysis, nutrient calculation, and cost calculation.							

Unit-III	Diet in kidney disorders and Diabetes mellitus Glomerulonephritis, nephrotic syndrome, renal failure, dialysis: menu planning, preparation, standardization, sensory analysis, nutrient calculation, and cost calculation. Type 1, type 2, GDM: menu planning, preparation, standardization, sensory analysis, nutrient calculation, and cost calculation.	
Unit-IV	Diet for cardiovascular diseases: Diet in Cardiovascular disease - Hypertension, atherosclerosis, congestive heart failure, coronary heart disease: menu planning, preparation, standardization, sensory analysis, nutrient calculation, and cost calculation. Dietary counseling for cardiovascular and its associated complications.	
Unit-V	Diet counseling for different conditions: Preparation of Diet Counseling aids for common disorders. Dietary counseling of the patients. Different types of nutritional counseling, importance of nutritional counseling. Nutritional assessment of pediatrics and adults by IAP, SGA: menu planning, preparation, standardization, sensory analysis, nutrient calculation, and cost calculation..	
Textbook	<ol style="list-style-type: none"> 1. Stump SE, Nutrition and Diagnosis Related Care, 7th edition, Lippincott Williams and Wilkins, Canada, 2012. 2. Gopalan C., Ramanathan, P.V. Balasubramanian, S.C., Nutritive value of Indian foods, NIN, Hyderabad, 2010 	
Reference Book	<ol style="list-style-type: none"> 1. Srilakshmi B Dietetics, sixth edition, new age publishing press, New Delhi 2011 2. 2.Mariam M et al., Clinical Nutrition for surgical patients, Jones and Bartlett Publishers, Canada 2008 3. Joshi Y.K. Basics of clinical nutrition, 2nd edition, JP Medical Publishers Private Ltd, New Delhi 2008 	
E-Reference	https://www.anddeal.org/	

Mapping of Cos with POS & PSOs

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	S	S	S	M	S	M	S	S	S

CO2	S	S	M	S	S	S	M	S	M	S	S	S
CO3	S	S	M	S	S	S	M	S	M	S	S	S
CO4	S	S	M	S	S	S	M	S	M	S	S	S
CO5	S	S	M	S	S	S	M	S	M	S	S	S

Strongly Correlating(S)
Weakly Correlating(W)

3 Marks
1 Mark

Moderately Correlating(M)
No Correlation(N)

2 Marks
0 Mark

Course Code	P23NDE2A	SEMESTER II	YEAR-I	Credits	L	T	P	Hrs
ELECTIVE III		FOOD SAFETY AND QUALITY CONTROL		3	4	-	-	4
Discipline Centric								
Cognitive level	K1- Recall; K2 – Understand; K3 – Analyze; K4 – Apply;							
Learning Objectives	The course aims to <ul style="list-style-type: none"> ➤ To study the importance of food safety and quality. ➤ To know the laws and standards ensuring food quality and safety. ➤ To know about the food additives and adulterants. 							
Course Learning Outcomes	On successful completion of the course, the students will be able to							
	S. No	Outcomes					Domain of Learning	
							Cognitive	
							e	
	CO1	The various criteria of food safety and quality.					K2	
	CO2	The role and significance of national and international food law that ensures the safety of the food products.					K3	
	CO3	Food additives and adulterants information and its consequences.					K4	
CO4	Various food safety programs.					K2		
CO5	The laws and standards ensuring food quality and safety.					K3		
Units	Course Contents							
Unit-I	Food safety: Principles of quality control and safety, need of quality control and safety, strategy and criteria for food safety, Quality Standards – mandatory standards, Quality Standards - optional standards, Consumer lifestyle, Consumer demand, issues in food safety, food traceability, food recall.							
Unit-II	Importance of food safety Importance of food safety in the food processing industry, risk classification, national and international food regulatory agencies, nutritional labeling regulation (mandatory and optional nutrients, nutritional descriptors, and approved health claims); microbial contamination (including cross-contamination/indirect contamination), chemical contamination, physical contamination, and allergen contamination.							

Unit-III	<p>Food Additives and Adulterants</p> <p>Food Additives and Adulterants: Food additives definition; Common food additives and their function and usage; Permissible limits of additives in foods; Implications of additives on consumers' health; Food adulteration: Meaning and definition; Types of food adulterants; Methods used for detection of food adulterants.</p>	
Unit-IV	<p>Food safety programs</p> <p>Food safety programs: HACCP, Codex Alimentarius, pest control program, facility maintenance, personal hygiene, supplier control, sanitary design of equipment and infrastructure, procedures for raw material reception, storage, and finished product loading, sanitation program. Sanitation standard operating procedures (SSOPs), product identification, tracking and recalling program, preventive equipment..</p>	
Unit-V	<p>Food Laws and Standards</p> <p>Food Laws and Standards: Need and importance; National food legislation such as FSSA, Essential Commodities Act, ISI, or BIS, AGMARK, FPO, and PFA; International Organization such as FAO, WHO, Codex Alimentarius, and APEDA. Good Manufacturing Practices (GMP), Good Hygienic Practices (GHP), Good Laboratory Practices (GLP), ISO 22000, FSSC 22000, Food Safety Audit.</p>	
Textbook	<ol style="list-style-type: none"> 1. Ronald H. Schmidt, and Gary E. Rodrick., “Food Safety Handbook,” John Wiley & Sons, NewJersey, 2005. 2. Yasmine Motarjemi and HuubLelieveld., “Food Safety Management - A Practical Guide for the Food Industry,” Elsevier,NewYork,2014. 3. FSSAI., “Manual of Food Safety Management System,” FSS Act, 2006, Ministry of the Health and Family Welfare, New Delhi,2006 4. FSSAI. “Food Safety and Standards Regulations – 2011”, Ministry of the Health and Family Welfare, New Delhi, 2011. 5. InteazAlli, “Food Quality Assurance: Principles and Practices,” 2nd Edition, Taylor and Francis, UK, 2014. 	
Reference Book	<ol style="list-style-type: none"> 1.George, A.B. 2006. Encyclopedia of Food and Color Additives. Vol. III. CRC 	

	Press. 2. Surendar S. Ghokrokta. "Science and Strategies for Safe Food," CRC Press, USA, 2017. 3. Branen, A.L., Davidson PM & Salminen S. 2001. Food Additives. 2nd Ed. Marcel Dekker.
E-Reference	https://www.fsis.usda.gov/

Mapping of Cos with POS & PSOs:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	M	S	S	M	S	M	S	M
CO2	S	S	S	S	M	S	S	M	S	M	S	M
CO3	S	S	S	S	M	S	S	M	S	M	S	M
CO4	S	S	S	S	M	S	S	M	S	M	S	M
CO5	S	S	S	S	M	S	S	M	S	M	S	M

Strongly Correlating (S)	-	3 Marks
Moderately Correlating (M)	-	2 marks
Weakly Correlating (W)	-	1 Mark
No Correlation (N)	-	0 mark

Course Code	P23NDE2B	SEMESTER II	YEAR-I	Credit	L	T	P	Hrs
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				s				
ELECTIVE III Discipline Centric		NUTRITION AND FITNESS		3	4	-	-	4
Cognitive level	K1- Recall; K2 – Understand; K3 – Analyze; K4 – Apply;							
Learning Objectives	The course aims to <ul style="list-style-type: none"> ➤ Learn about the terms related to health and fitness ➤ comprehend the interaction between fitness and nutrition 							
Course Learning Outcomes	On successful completion of the course, the students will be able to							
	S. No	Outcomes					Domain of Learning	
							Cognitive	
	CO1	Outline the self-responsibility for personal health and wellness.					K2	
	CO2	Analyze the role of nutrition in sports.					K2	
	CO3	Discuss the various parameters used to find health status.					K3	
	CO4	Evaluate the effect of exercise on various nutrient metabolisms.					K2	
CO5	Compare different exercise methods and learn their application.					K4		
Units	Course Contents							
Unit I	Health Concept of Health, changing concepts definitions of health, dimensions of health, the concept of wellbeing, the spectrum of health, determinants of health, ecology of health, right to health, responsibility for health, indicators of health. Individual health indicators, national health indicators.							
Unit-II	Exercise and health-related fitness Health-related fitness, health promotion, physical activity for health benefits. Sports-related fitness: Role of nutrition in sports, nutrition to athletic performance. Energy substrate for activities of different intensity and duration, aerobic and anaerobic activities.							

Unit-III	Body weight and composition for health and sports Nutritional considerations for a sports / exercising person as compared to a normal active person. Ideal body weight, values, and limitations of the BMI, composition of the body, Diet during training, before the competition, during Dietary supplements after the competition for sports. Carbohydrates as an energy source for sport and exercise.	
Unit-IV	Exercise performance Carbohydrate stores, Fuel for aerobic and anaerobic metabolism Glycogen re-synthesis and CHO Loading e. CHO composition for a pre-exercise, during, and recovery period. Diets for persons with - High energy requirements, Stress, Fracture, and Injury. Protein requirement and metabolism during endurance exercise	
Unit-V	Exercise programmes Resistance exercise training, aerobic exercise, types of exercise, effective for weight contrast, - dieting or exercise, weight reduction program for young athletes. Factors affecting fat oxidation (intensity, duration, training status, CHO feeding) Effect of fasting and fat ingestion.	
Textbook	1.Melvin Williams, Nutrition for Health, Fitness and Sports, Seventh edition, MC Graw Hill International Edition, USA, 2005. 2. Micheal J Nutrition and Metabolism, Blackwell Publishing Company, Bangalore, 2004. 3. Srilakshmi B, Suganthi V, Ashok CK. Exercise physiology, fitness, and Sports Nutrition. New age international publishers, 2018.	
Reference Book	1.Dunford M, Fundamentals of Sports and Exercise Nutrition, Human Kinetics, Illinois, 2010 2. Jeukendrup A and Gleeson M, Sports Nutrition: An introduction to energy production and performance, Human Kinetics Publishers, 2004 3. Maughan RJ, Burke LM, Handbook of Sports Medicine & Science- Sports Nutrition, Blackwell Science publications, 2002 4. Richard B. Kreider, 2019. Essentials of Exercise & Sports Nutrition: Science to Practice Kindle Edition. Lulu publishing services.	

E-Reference	https://www.hsph.harvard.edu/nutritionsource/

Mapping of Cos with POS & PSOs:

CO/PO		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	S	M	S	S	S	M	M	S	M
CO2	S	S	S	S	S	M	S	S	S	M	M	S	M
CO3	S	S	S	S	S	M	S	S	S	M	M	S	M
CO4	S	S	S	S	S	M	S	S	S	M	M	S	M
CO5	S	S	S	S	S	M	S	S	S	M	M	S	M

Strongly Correlating (S) - 3 Marks

Moderately Correlating (M) - 2 marks

Weakly Correlating (W) - 1 Mark

No Correlation (N) - 0 mark

Course Code	P23NDE2C	SEMESTER II	YEAR-I	Credits	L	T	P	Hrs
ELECTIVE III		ICT TOOLS FOR NUTRITION EDUCATION		3	4	-	-	4
Discipline Centric								
Cognitive level	K1- Recall; K2 – Understand; K3 – Analyze; K4 – Apply;							
Learning Objectives	The course aims to <ul style="list-style-type: none"> ➤ Learn about the terms related to health and fitness ➤ Create awareness among people with Mass media and advertisement. ➤ Develop the tools for nutrition education 							
Course Learning Outcomes	On successful completion of the course, the students will be able to							
	S. No	Outcomes					Domain of Learning	
							Cognitive	
							e	
	CO1	various concepts of nutrition education					K2	
	CO2	ICT significance nutrition education					K3	
	CO3	different tools in nutrition education					K4	
CO4	content making for nutritional and health issues					K2		
CO5	creation of mobile apps, videos, online counseling					K3		
Units	Course Contents							
Unit I	ICT in Nutrition Education ICT in Nutrition Education a) Nutrition Education- Nature and Importance to the Community, Objectives, Training Workers in Nutrition Education, and Extension Work. ICT tools to include - Printed media (Newspaper, books, journal magazines) - Computers - Telephones - Communication Network - E-mail - Electronic media (Radio, television, videos films) - Telex - Satellite –Internet.							
Unit-II	Principles of nutrition education Principles of Planning, Executing and Evaluating Nutrition Education Programs. c) Problems of Nutrition Education Programs and Approaches to overcome.							

	Information and communication devices for making learning in food and Nutrition education: concepts. Develop nutritional messages/ slogan on health and nutrition issues for vulnerable groups in the community.	
Unit-III	<p>Nutrition education tools</p> <p>Selection and development of appropriate ICT aids for different health and nutrition issues for various vulnerable groups in the community – chart, poster, leaflet, flipbook/flashcard.</p> <p>Development of nutritional games on health and nutrition issues for vulnerable groups in the community.</p>	
Unit-IV	<p>Different audio-visual aids in nutrition education</p> <p>Audio-Video messages through mobile phones, mobile apps, alert calls regarding nutritional uptake of rural mass and regular health checkups. Package of practices of nutrient rich varieties. Monitoring and feedback mechanism through mobile based applications.</p> <p>Dissemination of recommended dietary requirement [carbohydrate, protein, fat, vitamin, minerals and dietary fibre) to rural mass. Nutritional Campaigns organization and mass awareness in villages.</p>	
Unit-V	<p>Nutritional intervention through ICT</p> <p>Analyze the dietary intake and calorie requirement. Analyze the required quantity carbohydrate, protein, fat, vitamin, minerals and dietary fibre - Content Development regarding best nutrition practices.</p> <p>Mobile based nutritional awareness: nitrify India, Dietary guidelines for Indians, Nutrition atlas, vikaspedia, blog creation online diet counseling: scope and importance.</p>	

Textbook	<ol style="list-style-type: none"> 1. Suryatapas –Textbook of Community Nutrition, Academic Publishers,2016. 2. Prabha Bisht- Community Nutrition in India, Star Publications,2017. 3. B.Srilakshmi - Nutrition Science, New Age International, 2006.
Reference Book	<ol style="list-style-type: none"> 1. Swaminathan.M- Advanced Textbook on Food & Nutrition Vol 1& 2,Bappco. 2. Hyun, Taisun, Miyong Yon, Sun Hee Kim, Nan Hee Kim, Suk Mi An, Sun Mi Lee, Hyun Jung Chi et al. "Development of a nutrition education website for children." <i>Korean Journal of Community Nutrition</i> 8, no. 3 (2003):259-269. 3. Bhatt D.P, Health Education, Khel Sahitya Kendra, New Delhi,2008.
E-Reference	https://www.nutrition.gov/subject/nutrition-education-store

Mapping of Cos with POS & PSOs:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	M	M	S	M	M	M	S	M	S	M
CO2	M	S	M	M	S	M	M	M	S	M	S	M
CO3	M	S	M	M	S	M	M	M	S	M	S	M
CO4	M	S	M	M	S	M	M	M	S	M	S	M
CO5	M	S	M	M	S	M	M	M	S	M	S	M

Strongly Correlating(S)	-	3Marks
Moderately Correlating (M)	-	2Marks
Weakly Correlating (W)	-	1Mark
No Correlation (N)	-	0Mark

Course Code	P23NDS1A	SEMESTER II	YEAR-I	Credits	L	T	P	Hrs	
NME Skill Enhancement Course (SEC-1)		PUBLIC HEALTH NUTRITION		2	4	-	-	4	
Cognitive level	K1- Recall;K2 – Understand;K3 – Analyze;K4 – Apply;								
Learning Objectives	<p>The course aims to On successful completion of this course, the student will be able to:</p> <ul style="list-style-type: none"> • To make the communication process with small and large groups • To create awareness among people with Mass media and advertisement. • To develop the tools for nutrition education 								
Course Learning Outcomes	On successful completion of the course, the students will be able to								
	S. No	Outcomes					Domain of Learning Cognitive		
	CO1	Plan and prepare low-cost nutritious dishes/menus for vulnerable groups.					K3		
	CO2	Preparation of communication aids and planning nutrition education programs for the community.					K6		
	CO3	The ongoing national nutrition programs					K2		
	CO4	Basic community-based survey and nutrition education.					K5		
	CO5	Specific foods and their food regulations					K2		
Units	Course Contents								
Unit I	<p>Nutritional Assessment: Anthropometrical and biochemical Assessment of Nutritional Status, Dietary surveys, anthropometry and body composition, biochemical and clinical methods. Anthropometric assessment: IBW, BMI, kanwati index, Gomez classification, fat free mass measurements, WHR, skin fold measurements. etc. Biochemical assessment: Blood analysis and hemogram, clinical assessment for deficiency diseases. Albumin, prealbumin, CRP, transferrin, hemoglobin, urea and creatine, lymphocytes, and point deficiencies.</p>								

Unit-II	<p>Assessment: clinical and dietary</p> <p>Clinical assessment for nutritional deficiency diseases, Dietary assessment: 24-hour dietary recall, food frequency, 3-day dietary recall. Stress scale (Standard), personality test (MMPI), cognition tests. Standardization of tools and techniques,</p>	
Unit-III	<p>Development of low - cost recipes</p> <p>Development of low-cost recipes: recipe design, standardization, cost calculation. Development of recipes for needed communities: infants, preschoolers, elementary school children, adolescents, pregnant and lactating mothers. The sensory analysis of developed recipes with rating scales.</p>	
Unit-IV	<p>Field visit</p> <p>Field visits to ongoing national nutrition programs: Integrated Child Development Services, Mid-day meal program, Iron folic acid supplementation, de-worming, maternal and child welfare programs, vaccination centers, primary health centre, nutrient ball supplementation.</p> <p>.</p>	
Unit-V	<p>Weaning food</p> <p>Importance of weaning foods, rules and regulations for weaning foods, specific regulating conditions applicable for baby foods and foods for immune competence. Formulation of different weaning foods: nutrient calculation, sensory analysis, and cost calculation.</p>	
Textbook	<ol style="list-style-type: none"> 1. ChanderVir S, Public Health Nutrition in developing countries,PartI,1stedition,Woodhead Publishing, New Delhi,2011. 2. ParkK,Park’s Textbook of preventive medicine,2005.3.Bamji,Text book of Human Nutrition, Oxford publishers, New Delhi,2010 	

Reference Book	<ol style="list-style-type: none"> 1. ChanderVirS, Public Health Nutrition in developing countries, Part II, 1st edition, Woodhead Publishing, New Delhi, 2011 2. Gopalan C. Ramanathan, P.V. Balasubramanian, S.C., Nutritive value of Indian foods, NIN, Hyderabad, 2010. 3. Bhatt VB, Protein Energy Malnutrition, Pee Publishers, New Delhi, 2008 4. Sharma N, Child Nutrition, 1st edition, Murarilal & sons, New Delhi, 2006 5. Gupte S, Textbook of Pediatric Nutrition, Pawaninder P Vij Publishers, New Delhi, 2006.
E-Reference	https://www.who.int/teams/nutrition-and-food-safety

Mapping of Cos with POS & PSOs

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	S	S	M	S	S	S	S	M
CO2	S	S	S	M	S	S	M	S	S	S	S	M
CO3	S	S	S	M	S	S	M	S	S	S	S	M
CO4	S	S	S	M	S	S	M	S	S	S	S	M
CO5	S	S	S	M	S	S	M	S	S	S	S	M

Strongly Correlating(S)
Weakly Correlating(W)

3 Marks
1 Mark

Moderately Correlating(M)
No Correlation(N)

2 Marks
0 Mark

Course Code	P23NDS1B	SEMESTER II	YEAR-I	Credits	L	T	P	Hrs
NME- Skill Enhancement Course (SEC-1)	WOMEN AND HEALTH			2	4	-	-	4
Cognitive level	K1- Recall;K2 – Understand;K3 – Analyze;K4 – Apply;							
Learning Objectives	The course aim is to On successful completion of this course the student will be able to: <ul style="list-style-type: none"> ➤ to have appropriate knowledge of women’s health ➤ to address women’s Development and Empowerment 							
Course Learning Outcomes	On successful completion of the course, the students will be able to							
	S. No	Outcomes					Domain of Learning	
							Cognitive	
	CO1	The status of women’s health.					K2	
	CO2	Health care services and available health care providers.					K3	
	CO3	Critical issues in women’s health					K4	
	CO4	Women’s health and education					K2	
CO5	Health policy in India and international perspectives on health.					K3		
Units	Course Contents							
Unit I	Basics of women’s health Concept of health, Concept of Women’s Health, the status of women’s health. Adolescent health: adolescent sexual and reproductive health, global strategy for adolescent health, adolescent mental health, adolescent pregnancy, adolescent nutritional requirements, nutritional deficiencies, eating disorders, obesity, underweight and adolescent anemia sexually transmitted diseases.							

Unit-II	<p>Maternal nutrition</p> <p>Maternal nutrition: MMR, health care delivery system, stages of pregnancy, physiological changes of pregnancy, nutritional requirements in pregnancy, nutritional deficiencies, complications of pregnancy: Anemia, under nutrition, Gestational Diabetes Mellitus (GDM), Pregnancy-induced Hypertension (PIH).</p>	
Unit-III	<p>Nutritional needs in lactation</p> <p>Nourishing health: the physiological process of lactation, nutritional needs in lactation period, problems of lactation, the importance of breastfeeding, nutritional problems in the lactation period.</p>	
Unit-IV	<p>Health needs of women</p> <p>Health needs of women: early, middle and late adulthood, nutritional needs in adulthood period, Polycystic ovarian disease, hormonal imbalances, menopause hormonal changes, nutritional care in menopause period.</p>	
Unit-V	<p>Lifestyle diseases of women</p> <p>Lifestyle diseases of women: breast cancer, cervical cancer, osteoporosis, arthritis, and other degenerative diseases: incidence, causes, dietary preventive measures.</p> <p>Health care programs to improve women's health: International, national and state-level agencies for women's health</p>	
Textbook	<ol style="list-style-type: none"> 1. B. Srilakshmi S. Dietetics (5th edition) New age international publishers, Park, K.: Park's Textbook of Preventive and Social Medicine, 18th Edition, M/s. BanarasidasBhanot, Jabalpur,2000. 2. Swaminathan, M. Essentials of Food and Nutrition, Vols. I and II. Ganesh & Co.2000. 	

Reference Book	1. Indian National Code for Protection and Promotion of Breast Feeding, Govt. of India. Ministry of Social Welfare, NewDelhi. 2. Mahan LK, Stump SE and Raymond JL, Krause's Food and Nutrition Care Process, 13th Edition, Elsevier Saunders, Missouri,2012
E-Reference	https://www.cdc.gov/

Mapping of Cos with POS & PSOs:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	S	S	M	M	S	S	M	S	M
CO2	S	S	M	S	S	M	M	S	S	M	S	M
CO3	S	S	M	S	S	M	M	S	S	M	S	M
CO4	S	S	M	S	S	M	M	S	S	M	S	M
CO5	S	S	M	S	S	M	M	S	S	M	S	M

Strongly Correlating(S) -3Marks

Moderately Correlating (M) -2Marks

Weakly Correlating (W) -1Mark

No Correlation (N) -0Mark

Course Code	P23NDS1C	SEMESTER II	YEAR-I	Credits	L	T	P	Hrs	
NME- Skill Enhancement Course (SEC-1)	FOOD PROCESSING			2	4	-	-	4	
Cognitive level	K1- Recall; K2 – Understand; K3 – Analyze; K4 – Apply;								
Learning Objectives	<p>The course aims to On successful completion of this course, the student will be able to:</p> <ul style="list-style-type: none"> To be knowledgeable about the applications of preservation. To distinguish different preservation processes. 								
Course Learning Outcomes	On successful completion of the course, the students will be able to								
	S. No	Outcomes					Domain of Learning		
							Cognitive		
	CO1	The importance and methods of post-harvest conservation of foods.					K2		
	CO2	Food processing. technology for preservation and production					K1		
	CO3	Various food processing techniques and its recent developments in milk processing					K3		
	CO4	various food processing technology and their applications in beverages					K2		
CO5	food fortification and enrichment in fermentation techniques					K2			
Units	Course Contents								
Unit I	<p>Basic requirements in general for a food processing unit. Basic requirements in general for a food processing unit: The principle underlying food processing operations, Physical means in food processing operation (including thermal, radiation, refrigeration, freezing, & dehydration) Chemical means in food processing (by sugar, salt, curing, smoke, acids and chemicals, Effect of processing on physicochemical characteristics</p>								

Unit-II	<p>Preservatives and processing of various foods</p> <p>Different types of preservatives, natural and chemical preservatives, use of class II preservatives: advantages and disadvantages. Processing Technology for the preservation and production of various food products. Processing of cereals, legumes, oilseeds, fruits, and vegetables.</p>	
Unit-III	<p>Processing Technology for milk and milk products</p> <p>Processing Technology for milk and milk products. Indigenous milk products panner and yogurt. Egg processing – manufacturing of egg powder. Fleshy food processing – preprocessing, canning, dehydro freezing, dehydration of meat, poultry, and fish, smoking and curing of meat, fish oil extraction.</p>	
Unit-IV	<p>Beverages and sugar processing</p> <p>The brief manufacturing process of coffee, tea, cocoa, ready-to-serve beverages: treating water, compounding ingredients, carbonating product, filling product, packaging. Hazard prevention in beverage processing, potential risks and health effects. Sugar – Manufacturing of sugar from sugarcane and palm, sugar cubes, and powdered sugar.</p>	
Unit-V	<p>Recent advances in food technology</p> <p>Incorporation of conventional and innovative techniques in food processing: food fortification: in wheat flour, salt, oil rice and milk. Importance of food fortification and its recent developments in India. Technologies underlying in enrichment, fermentation, malting, germination.</p>	
Textbook	1. Srilakshmi, M., Food science, New Age International (P) Ltd.,	

	<p>Publishers2010.</p> <ol style="list-style-type: none"> Swaminathan, M., Food science, Chemistry and Experimental Foods, Bappco Publishers,2005 Potter, Norman N., and Joseph H. Hotchkiss. Food Science. Springer Science & Business Media, 2012. Manay S and Swamy S, Food Facts and Principles, New Age International (P) LtdPublishers, New Delhi,2001.
Reference Book	<ol style="list-style-type: none"> Jood S and Khetarpaul N, Food preservation, Agro tech Publishing, Udaipur,2002 Manay S andSwamyM S, Foods: Facts and Principles, New Age International (P) Limited, Chennai,2005. Swaminathan,M.Advanced Textbook on Food Science and Nutrition, Vol:2, Second edition, Reprinted, Bangalore Printing and publishing Co Inc, Bangalore,2003
E-Reference	https://www.cdc.gov/women/

Mapping of Cos with POS & PSOs

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	S	S	M	S	S	S	M	M	S	S
CO2	S	M	S	S	M	S	S	S	M	M	S	S
CO3	S	M	S	S	M	S	S	S	M	M	S	S
CO4	S	M	S	S	M	S	S	S	M	M	S	S
CO5	S	M	S	S	M	S	S	S	M	M	S	S

Strongly Correlating(S)	-	3Marks
Moderately Correlating (M)	-	2Marks
Weakly Correlating (W)	-	1Mark
No Correlation (N)	-	0Mark

